

CLAIMS

1. A packet-based wireless communication system for communicating with a mobile node, comprising:
 - a virtual private network having a security gateway and a home agent, wherein said mobile node is connected to a foreign network and information packets are transmitted to the mobile node from the virtual private network, and wherein said security gateway on the virtual private network is connected to said home agent; and
 - a correspondence node coupled to said home agent on the virtual private network, wherein an information packet transmitted from the correspondence node is encapsulated by the home agent before forwarding to the security gateway for forwarding to the mobile node.
2. The packet-based wireless communication system for communicating with a mobile node of Claim 1 wherein the security gateway encrypts the information packet.

3. The packet-based wireless communication system for communicating with a mobile node of Claim 1 wherein the security gateway further encapsulates the information packet.
4. The packet-based wireless communication system for communicating with a mobile node of Claim 1 wherein the communication system does not use an external home agent for forwarding the information packet to the mobile node.
5. The packet-based wireless communication system for communicating with a mobile node of Claim 1 wherein the information packet includes an address for the security gateway.
6. The packet-based wireless communication system for communicating with a mobile node of Claim 1 wherein the information packet includes a virtual private network tunnel inner address.

7. The packet-based wireless communication system for communicating with a mobile node of Claim 1 wherein the security gateway transmits the information packet to the home agent to forward outside the virtual private network to the mobile node.

8. An information packet transmitted on a packet-based communication system, comprising:
 - a home address for a mobile node associated with a virtual private network, said mobile node coupled to a foreign network;
 - a virtual private network tunnel address used for routing packets to a virtual private network gateway within the virtual private network;
 - a virtual private network gateway address used to route packets transmitted to the virtual private network gateway from locations outside the virtual private network;
 - and
 - a care-of address designating a location for said mobile node on the foreign network.
9. The information packet for a packet-based communication system of Claim 8 wherein the information packet is forwarded outside the virtual private network from the virtual private network gateway using the care-of address for the mobile node.

10. The information packet for a packet-based communication system of Claim 8 wherein the information packet is forwarded outside the virtual private network from a home agent located on the virtual private network using the care-of address for the mobile node.
11. The information packet for a packet-based communication system of Claim 8 wherein the virtual private network gateway encrypts the information packet prior to transmission to the mobile node.
12. The information packet for a packet-based communication system of Claim 8 wherein the home agent appends the virtual private network tunnel inner address to the information packet to route the packet to the virtual private network gateway inside the virtual private network.

13. The information packet for a packet-based communication system of Claim 8 wherein the virtual private network gateway appends the care-of address prior to transmitting the information packet from the virtual private network.
14. The information packet for a packet-based communication system of Claim 8 wherein the home agent appends the care-of address prior to transmitting the information packet from the virtual private network.
15. The information packet for a packet-based communication system of Claim 8 wherein the virtual private network gateway appends the virtual private network gateway address for routing packets to the virtual private network gateway.

16. A method for packet-based communication to a mobile node from a correspondence node on a virtual private network, comprising the steps of:
 - providing a virtual private network associated with a mobile node connected to a foreign network;
 - providing a security gateway located on the virtual private network and connected to a home agent and a correspondence node on the virtual private network;
 - forming an information packet for transmission to the mobile node;
 - transmitting the information packet to the security gateway;
 - encapsulating the information packet at the security gateway; and
 - forwarding the information packet to the mobile node without using an external home agent.

17. The method for packet-based communication to a mobile node from a correspondence node on a virtual private network of Claim 16, further comprising the step of:

encrypting an encapsulated information packet at the security gateway to forward to the mobile node.
18. The method for packet-based communication to a mobile node from a correspondence node on a virtual private network of Claim 16, further comprising the step of:

encapsulating the information packet at the home agent with an address for the security gateway to use within the virtual private network to route packets to the security gateway.
19. The method for packet-based communication to a mobile node from a correspondence node on a virtual private network of Claim 16, further comprising the step of:

transmitting the information packet out of the virtual private network from the home agent.

20. The method for packet-based communication to a mobile node from a correspondence node on a virtual private network of Claim 16, further comprising the step of:

transmitting the information packet out of the virtual private network from the security gateway.